

TRIGGERS FOCUS GROUP
RECOMMENDATION #3
FOLLOW UP SAMPLING FOR WATER QUALITY EXCEEDANCES OF FIELD
PARAMETERS
9 May 2006

OBJECTIVE OF FOLLOW UP SAMPLING WATER QUALITY EXCEEDANCES OF FIELD PARAMETERS: The objective of this requirement is to obtain information regarding the source, frequency, and magnitude of the water quality exceedance.

PROBLEM STATEMENT: The Compliance Monitoring section of the draft Coalition Group MRP requires re-sampling at a monitoring site whenever a sample exceeds a receiving water limitation or water quality objective. Specifically, the draft MRP indicates that:

“the Coalition shall re-sample the monitoring site(s) where the exceedance was reported for each constituent that exceeds a receiving water limitation or water quality objective and at two or more sites upstream of the monitoring site with the exceedance (a total of three or more samples) within 72 hours of the submittal of the Exceedance Report....The Coalition Group will continue this re-sampling strategy for each detection that is an exceedance in the re-sampling results, until re-sampling results are below the receiving water limitation that implements the appropriate Basin Plan’s water quality objective.”

This requirement presents technical, scientific, and logistical challenges for Basin Plan exceedances of parameters measured in the field (e.g., pH, dissolved oxygen, and conductivity). Some of these parameters (e.g., pH and dissolved oxygen) may vary diurnally based on natural conditions alone. During daylight hours, when photosynthesis is occurring, dissolved oxygen levels rise. At night, respiration is the driving force, resulting in a decrease in dissolved oxygen. In a diurnal cycle, the lowest pH is expected at dawn because CO₂ produced by decomposition and aerobic respiration would have accumulated since the previous dusk. Conversely highest pH is expected during the daylight hours, because pH rises at the rate at which carbon dioxide is fixed by plants. Both pH and dissolved oxygen may also be affected by anthropogenic sources (e.g., elevated nutrients resulting in increased algae populations can result in elevated pH readings). Obviously, pH and dissolved oxygen data are indicators of other natural and potentially anthropogenic water quality parameters and conditions. Similarly, elevated conductivity may similarly be due to anthropogenic factors, as well as natural soil geological conditions. For this reason, a weight of evidence, broad-based approach should be considered when addressing water quality issues related to pH, dissolved oxygen, and conductivity.

Currently, a single measure of pH, dissolved oxygen, or conductivity that exceeds a Basin Plan objective is considered a water quality exceedance even if it cannot be determined from the single measurement if natural conditions or anthropogenic factors are responsible for the exceedance. The Basin Plan indicates, “in determining compliance with the water quality objective for pH, appropriate averaging periods may be applied provided that beneficial uses will be fully protected.” However, the definition of what would comprise of an “appropriate averaging period” is not defined (e.g., multiple daily measurements, averaging monthly point measurements, etc.).

Therefore, the Triggers Focus Group is making the following recommendation to the TIC:

RECOMMENDATION:

Prior to reporting an exceedance receiving water limitation or water quality objective is reported for a field parameter result (e.g., *pH*, *dissolved oxygen*, or *conductivity*), it is critical that the field sampling team confirm that the field meter is properly functioning, is recording the proper units, has been calibrated the day of sample collection, and that the membrane/probes are clean and not damaged. When meter maintenance or malfunctions have been eliminated as the reason for an exceedance receiving water limitation or water quality objective, the exceedance must be reported. When meter maintenance or malfunctions have been eliminated as the reason for an exceedance receiving water limitation or water quality objective, the exceedance must be reported. When an exceedance of a receiving water limitation or water quality objective is reported for a field parameter result, the Coalition must have a pre-determined follow-up plan in their Monitoring and Reporting Program (MRP) Plan. This approach will provide flexibility for Coalitions to design site (or watershed) specific, science-based approaches to address this requirement. It is expected that the proposed approach will be based on historical monitoring data and possibly pesticide use data. Follow-up monitoring approaches may include, but may not be limited to, monitoring at two upstream sites, an evaluation of the source water (e.g., river or irrigation canal supply prior to entering the Coalition boundaries), re-sampling of the site with the water quality exceedance, moving upstream to identify the source on the day of the exceedance, and re-sampling at the time of re-sampling for toxicity testing (i.e., if toxicity testing indicates that a specific class of contaminants may be involved with the toxicity).

It is recommended that the narrative in the draft MRP be changed to read:

“the Coalition shall include a follow-up approach to address exceedances of receiving water limitation or water quality objectives for field pH and dissolved oxygen data in their MRP and shall implement the approach via the methods and within the timeline outlined in the Coalition MRP Plan approved by the Executive Officer of the Central Valley Water Board. The Coalition will continue implementing their follow-up approach until a source or sources of the water quality exceedance is identified via the methods and frequency proposed in the Coalition MRP. A definition of source or sources must be provided in the Coalition MRP, which may include, but is not limited to, an agricultural practice, upstream identification, non-farm related activities, or natural conditions. The results of field measurements, in conjunction with analytical chemistry results and site observations, should be collectively considered to provide a ‘weight of evidence’ approach toward identifying the source.”